

Cyclostratigraphy of the Early/Middle Eocene transition: a Pyrenean perspective

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An integrated bio-, magneto- and cyclostratigraphic study of the Ypresian/Lutetian (Early/Middle Eocene) transition along the Pyrenean Otsakar section (Payros et al., 2011) resulted in the identification of the C22n/C21r chron boundary and of the calcareous nannofossil CP12a/b zonal boundary; the latter is the main correlation criterion of the Lutetian Global Stratotype Section and Point (GSSP) recently defined at Gorrondatxe (Basque Country). By counting precession-related mudstone-marl couplets of 21 ka, the time lapse between both events was calculated to be of 819 ka. This suggests that the age of the CP12a/b boundary, and hence that of the Early/Middle Eocene boundary, is 47.76 Ma, 250 ka younger than previously thought. This age agrees with, and is supported by, estimates from Gorrondatxe based on the time lapse between the Lutetian GSSP and the C21r/C21n boundary. The duration of Chron C21r is estimated at 1.326 Ma. Given that the base of the Eocene is dated at 55.8 Ma, the duration of the Early Eocene is of 8 Ma, 0.8 Ma longer than in current time scales. The Otsakar results further show that the bases of planktic foraminiferal zones E8 and P10 are younger than the CP12a/b boundary. The first occurrence of *Turborotalia frontosa*, being approximately 550 ka older than the CP12a/b boundary, is the planktic foraminiferal event that lies closest to the Early/Middle Eocene boundary. The larger foraminiferal SBZ12/13 boundary is located close to the CP12a/b boundary and correlates with Chron C21r, not with the C22n/C21r boundary.

References:

Payros et al. (2011): Geological Magazine, doi:10.1017/S0016756810000890.

Funded by the Basque Government (GIC07/122-IT-215-07) and the Spanish Government (CGL2008-01780/BTE, CGL2008-00009/BTE, CGL2008-00809/BTE and CTM2006-06722/MAR).